

Claims:

5 1. A process for the production of a precursor material for use in the preparation of a stabilized alumina catalyst support material, which process comprises the steps of:

10 (a) providing a mixture comprising aluminium and barium containing compounds; and

15 (b) heating the mixture under conditions to form particles of boehmite at least partially coated with a layer comprising barium and/or a compound of barium.

2. A process as claimed in claim 1, wherein the mixture comprising aluminium and barium containing compounds is a substantially homogenous mixture.

20 <sup>5 at 3/11</sup> A process as claimed in claim 1 or claim 2, wherein the layer formed on the particles of boehmite comprises barium carbonate.

25 4. A process as claimed in any one of the preceding claims, wherein the aluminium containing compound comprises aluminium chloride, aluminium nitrate, aluminium sulphate, alumina and/or boehmite.

30 5. A process as claimed in any one of the preceding claims, wherein the barium containing compound comprises barium chloride, barium sulphate and/or barium nitrate.

35 6. A process as claimed in any one of the preceding claims, wherein the mixture comprising aluminium and

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# THE FORD FOUNDRY

1. A process as claimed in claim 12, wherein the hydrothermal treatment is carried out at a temperature in the range of from 90 to 300°C, more preferably from

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100 to 220°C.

5 14. A process as claimed in claim 12 or claim 13, wherein the hydrothermal treatment is carried out at a pressure in the range of from 1 to 150 bar, preferably from 5 to 50 bar.

10 15. A process as claimed in any one of claim 12 to 14, wherein the hydrothermal treatment is carried out for a time in the range of from 30 minutes to 25 hours, preferably from 1 to 10 hours.

15 16. A process as claimed in any one of claims 1 to 11, wherein the mixture in step (b) is heated at a temperature in the range of from ambient temperature to boiling temperature, preferably by a reflux process.

20 17. A process for the preparation of a stabilized alumina catalyst support material, which process comprises the steps of:

25 (i) providing a precursor material comprising particles of boehmite at least partially coated with a layer comprising barium and/or a compound of barium; and

30 (ii) heating the coated particles of boehmite to a temperature at which at least some of the boehmite transforms to gamma-alumina.

35 18. <sup>54A</sup> A process as claimed in claim 17, comprising the step of further heating whereby at least some of the gamma-alumina transforms to theta and/or delta-alumina.

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19. A process as claimed in claim 17 or claim 18, wherein said precursor material is produced according to a process as claimed in any one of claim 1 to 16.

5 ~~20.~~ A process for the preparation of an automotive catalytic converter, which process comprises the steps of dispersing a mixture comprising particles of boehmite at least partially coated with a layer comprising barium and/or a compound of barium on a  
10 metal or ceramic monolithic substrate, followed by heating the precursor mixture to a temperature at which at least some of the boehmite transforms to gamma-alumina.

15 21. A process as claimed in claim 20, comprising the step of further heating whereby at least some of the gamma-alumina transforms to theta and/or delta-alumina.

20 22. A process as claimed in claim 17 or claim 20, wherein heating is carried out at a temperature in the range of from 500 to 1000°C.

25 23. A process as claimed in claim 18 or claim 21, wherein the further heating is carried out at a temperature in the range of from 1000 to 1400°C.

30 24. A process for the preparation of a catalyst, such as an automotive catalytic converter, which process comprises the step of dispersing a stabilized alumina catalyst support material prepared according to the process of any one of claims 17 to 19 on a metal or ceramic monolithic substrate.

35 25. A precursor material for use in the preparation

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of catalyst support material, which precursor material comprises particles of boehmite and/or transition alumina at least partially coated with a layer comprising barium and/or a compound of barium.

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26. A precursor material as claimed in claim 25, wherein the layer formed on the particles of boehmite and/or transition alumina comprises barium carbonate, barium oxide and/or barium aluminate.

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~~27.~~ A precursor material as claimed in claim 25 or claim 26 provided in the form of a slurry or washcoat.

28. A stabilized alumina catalyst support material which comprises gamma, theta and/or delta-alumina, and which withstands substantial degradation to alpha-alumina after exposure to a temperature of approximately 1400°C for 1 hour.

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29. A stabilized alumina catalyst support material as claimed in claim 28, wherein particles of gamma, theta and/or delta-alumina are at least partially coated with a layer comprising barium carbonate, barium oxide and/or barium aluminate.

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30. A stabilized alumina catalyst carrier or support material as claimed in claim 28 or claim 29 having a specific surface area of at least 20 m<sup>2</sup>/g after exposure to a temperature of 1400°C for 1 hour.

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31. A stabilized alumina catalyst carrier or support material as claimed in any one of claims 28 to 30 having a specific surface area of at least 31 m<sup>2</sup>/g after exposure to a temperature of 1400°C for 1 hour.

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